

Clean Copy of All Outstanding Claims as Amended

1. (Amended) A loudspeaker comprising:
  - a diaphragm;
  - a rare earth magnet arranged to define a flux gap in a perimeter region of the diaphragm and having a central aperture;
  - a voice coil, wherein the voice coil comprises a cylindrical polymer bobbin having at least one flexible arm extending therefrom, the at least one arm having lead-in conductors embedded therein;
  - wire windings extending around the cylindrical bobbin, wherein the wire windings are connected to said lead-in conductors forming a low impedance voice coil and the arm and embedded lead-in conductors extend from said perimeter region toward said central aperture to provide a flexible connection to an input drive signal.
2. The loudspeaker of claim 1, wherein the wire windings are connected in parallel and layered on top of one another.
3. The loudspeaker of claim 2, wherein the coils comprise wires having round cross-sections.
4. The loudspeaker of claim 2, in which the magnet is a ring magnet and the lead-in connectors connect through a central opening in the magnet.
5. The loudspeaker of claim 4, wherein the flux gap is defined by a first pole piece forming a generally cup-like housing contacting a first side of the magnet, and a second pole piece contacting an opposite side of the magnet to position and focus magnetic flux as a substantially uniform field across said gap in the peripheral region.

6. The loudspeaker of claim 5, wherein the first and second pole pieces each have a central aperture therein.
7. The loudspeaker of claim 1, wherein the diaphragm has a diameter between approximately 0.7 and 1.5 inches.
8. The loudspeaker of claim 7, wherein the diaphragm is a shaped metal diaphragm having a mass loading layer on its surface.
9. The loudspeaker of claim 8, wherein the mass loading layer substantially doubles the mass of the diaphragm to shift its resonance below several hundred Herz.
10. The loudspeaker of claim 1, further comprising an air passage positioned centrally behind the diaphragm and communicating with an auxiliary acoustic space.
11. The loudspeaker of claim 1, wherein the wire windings comprise two or more wire coils connected in parallel and layered on top of one another to substantially fill the flux gap.
12. The loudspeaker of claim 11, further comprising a magnetic fluid restrained by flux to reside in the flux gap for effective thermal transfer from the coils.
13. The loudspeaker of claim 1, wherein the rare earth magnet contains neodymium.
14. The loudspeaker of claim 13, wherein magnet is a neodymium boron iron ring magnet.

15. (Amended) A loudspeaker system comprising at least one broad range speaker, each such broad range speaker including

a diaphragm having a diameter between about 15 and 40 millimeters and a polymer coating effective to suspend the diaphragm with a resonance below about 200 Hz;

a rare earth magnet arranged to define a flux gap in a perimeter region of the diaphragm and having a central aperture positioned behind the diaphragm;

a voice coil having a cylindrical polymer bobbin with at least one flexible arm extending therefrom, the at least one arm having lead-in conductors embedded therein;

wire windings in said gap and connected to drive the diaphragm down to resonance, wherein the wire windings are connected to the lead-in conductors, and wherein the <sup>PCM</sup> and embedded lead-in conductors extend between said perimeter region and the central aperture; and said system further includes

a console housing a subwoofer effective with said at least one broad range speaker to form a full range system.

15. (Amended) The loudspeaker system of claim 15, wherein the console includes a docking recess for an audio source and at least one class D amplifier for applying the audio source as an amplified drive signal to the speakers.
16. (Amended) A loudspeaker comprising:

a diaphragm having a diameter between about 15 and 40 millimeters and a polymer coating effective to suspend the diaphragm with a resonance below about 200 Hz;

a rare earth magnet arranged to define a flux gap in a perimeter region of the diaphragm and having a central aperture;

a voice coil having a cylindrical polymer bobbin with at least one flexible arm extending therefrom, the at least one arm having lead-in conductors embedded therein;

wire windings in said gap and connected to drive the diaphragm down to resonance, wherein the wire windings are connected to the lead-in conductors and

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wherein the arm and embedded lead-in conductors extend between said perimeter  
region and a the central aperture.